CITY OF SAN BRUNO

GROUNDWATER MONITORING WELLS: INSTALLATION AND MONITORING

2005 PROJECT WORK PLAN

The work plan is presented in three (3) tasks, and related subtasks. Upon notice of award of the grant by the Department of Water Resources (DWR), and in order to expedite the schedule, and to ensure that the proper project mobilization is provided, the City intends to fund part of the tasks within the work plan. These tasks include site selection and permit acquisition. In addition, the City intends to fund the sampling and testing for water quality, as part of its routine monitoring and sampling program. The City will utilize services of its consultant, WRIME, Inc. (Consultant), to conduct the tasks under this work plan. The City will prepare the bid documents, advertise, and select an appropriate driller to work with Consultant and city staff to drill the monitoring wells.

The project is not subject to the California Environmental Quality Act. Drilling permits will be obtained consistent with county and state requirements. The project is a feasibility and planning study, which is statutorily exempt from the preparation of an environmental impact report (Pub. Res. Code 21102). The proposed project is for drilling two monitoring wells, including geologic exploration, and will occur on public property or disturbed land. The City is the project proponent, and therefore during implementation of the project, the City will consider environmental factors in selecting sites for drilling and geologic exploration, and the selected sites will avoid impacts to sensitive resources. The project will not impact any sensitive habit area, species, or cultural resources. The program is intended to provide scientific data, and is seeking funding for a project involving only feasibility or planning studies for possible future actions which the City and other potentially responsible lead agencies have not approved, adopted, or funded, and is therefore statutorily exempt (Pub. Res. Code 21102, 21150). The project is also Categorically Exempt since it involves basic data collection, research, experimental management and resources evaluation activities that will not result in major disturbance to any environmental resources (Guidelines 15306). All activities will be performed in compliance with federal, State, and local regulations. Proper permits for monitoring well installation will be acquired from the City and County of San Francisco, San Francisco Airport authorities, as well as San Mateo County, when necessary. San Francisco Public Utilities Commission has indicated that it may assist in the siting of well clusters.

Task 1 – Design and Installation of Observation Well Clusters, and Groundwater Monitoring

City of San Bruno and its Consultant will coordinate with other stakeholders (Daly City, California Water Service Company, South San Francisco, and San Francisco Public Utilities Commission) for design, installation, and monitoring of two observation well clusters. Task 1 includes the drilling of 2 observation well clusters, with each cluster containing up to 3 wells screened at levels identified to be potential pathways for seawater intrusion.

Task 1 is divided into two major subtasks: Observation Wells and Groundwater Monitoring.

Subtask 1.1 – Observation Well Clusters

The Consultant in coordination with the City will select the sites for locating the monitoring wells and gain proper access to the sites using city funds. Two areas without existing monitoring capabilities have been identified as having relatively thick water-bearing zones and inland gradients, creating the potential for seawater intrusion. One well cluster will be placed in each of the areas identified as vulnerable at a specific location selected based on

existing hydrogeologic information. Access for drilling will also be considered when locating the well sites. Existing information, including the detailed geologic information developed for and contained in the Update on the Conceptualization of the Lake-Aquifer System, Westside Ground-Water Basin, San Francisco and San Mateo Counties and in the groundwater model and associated documentation, will be used to site the two observation well clusters.

The use of AB303 funds will begin with the design of the wells at the locations identified. The design process will be performed under the supervision of a California Registered Geologist and will extensively use the data gathered in the site selection process. Based on a preliminary evaluation of site conditions, it is expected that borings will be drilled to approximately 500 feet with wells installed to depths of approximately 200, 300, and 400 feet below ground surface. Wells will be constructed out of Schedule 40 PVC, 3" for the deep well and 2" for the two shallow wells for each cluster. Once the location has been selected and the well clusters have been designed, permits will be submitted to the San Mateo County Health Services Agency or the City and County of San Francisco Department of Public Health, Environmental Health Management. The permits will be prepared under the supervision of a California Registered Geologist and submitted with text and diagrams to fully document the proposed observation wells.

Upon selection of the well sites, the City will prepare the bid documents and conduct the selection process for selection of the driller contractor.

In order to allow ample time for scheduling the driller contractor, a tentative scheduling process will begin before permit applications are filed. If there are delays or problems in permitting, the drillers will be rescheduled.

A utility survey, either private or Underground Services Alert, will be performed prior to drilling.

The well clusters will be drilled sequentially using the mud rotary method. Drilling activities will operate under the driller's health and safety plan, which must be approved by the California Registered Geologist that will oversee the drilling. The process will be supervised by at least one California Registered Geologist who will log cuttings (using the Unified Soil Classification System), provide direction to drillers, ensure that the wells are installed to specifications, and make design changes in the field based on information obtained during drilling. Geophysical logging will include spontaneous potential and resistivity logs for both boreholes. Wells will be installed in accordance with California Well Standards and county regulations. Monitoring wells will be developed by surging until discharge water is clear. After the wells have been installed, they will be surveyed for x, y, ground surface elevation, and monitoring point elevation.

The observation well clusters will be included as part of the existing seawater intrusion monitoring network and will be regularly monitored (See Subtask 1.2).

The procedures followed and the results obtained from Subtask 1.1 will be outlined in a technical memorandum to be prepared in Subtask 1.3. A summary of the progress made in this subtask will be posted to the San Bruno's website. The public will be kept informed with three public meetings. The work plan schedule identifies the order of these public meetings.

The major steps in Subtask 1.1 are as follows:

- Determine the best locations for the observation wells
- Gain access to the locations
- Design the observation wells

- Obtain Permits
- Schedule the subcontractors
- Perform the utility survey
- Drill and install the observation well clusters
  - Mobilization
  - Drilling
  - Geophysical Logging
  - Completion
  - Development
  - Fluid containment and disposal
- Perform the land survey
- Analyze the data

Subtask 1.2 – Groundwater Monitoring

The new monitoring wells will be included as part of the existing network. Also joining the monitoring network will be the existing wells from the San Francisco International Airport (SFIA FOM) site. Agreements will be made with the well owner to use this cluster in the monitoring network. Also, all available information about this well cluster will be gathered to aid in the analysis of future monitoring results.

Monitoring costs will be paid by San Bruno as an addition to their existing monitoring program. AB303 grant funds will be used to add the SFIA FOM wells to the monitoring network, to update the sampling plan to include the SFIA FOM wells and the new monitoring wells, and to analyze the monitoring data.

Semi-annual monitoring activities will follow the guidelines set forth in Appendix C of the PGWMP, "Groundwater Monitoring Plan for the Westside Basin," and will include regular water level measurements and sampling for the standard suite of analytes: total dissolved solids, general inorganic (alkalinity, chloride, sulfate, calcium, magnesium, and sodium), iodine, bromide, and nitrates. Sampling activities will be performed by personnel with appropriate levels of experience in groundwater sampling. All monitoring activities will follow the quality control/quality assurance plan for groundwater monitoring.

As part of Subtask 1.2, an updated sampling plan will be produced and distributed to DWR, San Bruno, and other partners in the Westside Groundwater Basin. Documentation of efforts and results will be included in the technical memorandum to be prepared in Subtask 1.3. A summary of the progress made in this subtask will be posted to the San Bruno website and a public meeting will be held to discuss the monitoring process and results.

The major steps in Subtask1.2 are as follows:

- Adding the well cluster at the San Francisco International Airport (SFIA FOM) site to the regular monitoring locations.
- Updating the existing sampling plan to incorporate the new monitoring locations (SFIA FOM and the new monitoring well clusters).
- Conducting semi-annual monitoring.
  - Conduct water level measurements and collect samples.
  - Perform analytical tests

- Analyzing results.

Subtask 1.3 – Prepare Technical Memorandum No. 1

A draft and final technical memorandum will be prepared describing the observation well cluster installation and groundwater monitoring activities included in Subtasks 1.1 and 1.2. The final document will be distributed to DWR, San Bruno, and other partners in the Westside groundwater basin.

Task 1 Deliverables:

- Draft and Final Sampling Plan documenting the sampling and measurement procedures, frequency, and analyses. The plan will be an update of the existing plan.
- Draft and Final Technical Memorandum No. 1documenting the location and design of the observation wells and the data gathered during installation and development and the first two semi-annual monitoring events.

Task 2 – Enhanced Data Management

Task 2 builds upon the on-going Westside Basin data clearinghouse and the existing data management and archiving tools. In 2000, as recommended in the Westside Basin's proposed Groundwater Management Plan, a basin-wide data clearinghouse was established. Local agencies fund the San Mateo County Groundwater Protection Program to manage the clearinghouse. Data from routine, semi-annual monitoring activities are presently stored in a large number of Geographical Information System (GIS) and spreadsheet files with various formats.

Task 2 seeks to design and develop a system that will streamline data compilation and dissemination, provide more powerful analysis tools, and facilitate data extraction in a format that can be easily integrated into the groundwater model and linked with the GIS. WRIME's Hydrologic Data Management System (HDMS) has been used in the past to provide data management capabilities to a number of municipalities and water agencies. Stakeholders will be consulted in a workshop to determine their needs and visions for such a product. The HDMS will be developed to meet current and future stakeholder needs and will be populated with existing data. The internal modules of the HDMS will be utilized to assist in the quality control and assurance of the data. A users' manual will also be developed to help end-users fully utilize the functionality of the HDMS.

The HDMS and the users' manual will be provided to San Mateo County as a replacement for its current system of spreadsheet files. For informational purposes, the HDMS and the users' manual will also be distributed to DWR, San Bruno, California Water Services Company, Daly City, and San Francisco Public Utilities Commission. A summary of the progress made in this subtask will be posted to San Bruno's website, and the project will be discussed in the same meetings as the conclusion of well installation.

We foresee that the semi-annual monitoring data, provided to the county by local agencies, will then be routinely imported into the new HDMS using local funds already allocated for data management. Hence, the HDMS will be continually updated, as new information becomes available, making the information readily available to modeling updates, updated water quality assessments, and other analyses conducted with the data (for example, water level hydrographs, time-series plots, and contour mapping).

The major steps in Task 2 include:

- Draft and Final HDMS work plan based on a stakeholder workshop;

- Develop and populate HDMS;
- Draft and Final Technical Memorandum No. 2: a users' manual for HDMS; and

Task 2 Deliverables:

- Customized HDMS.
- Draft and Final Technical Memorandum No. 2, a users' manual for the HDMS.

Task 3 – Project Management, Coordination, and Public Participation

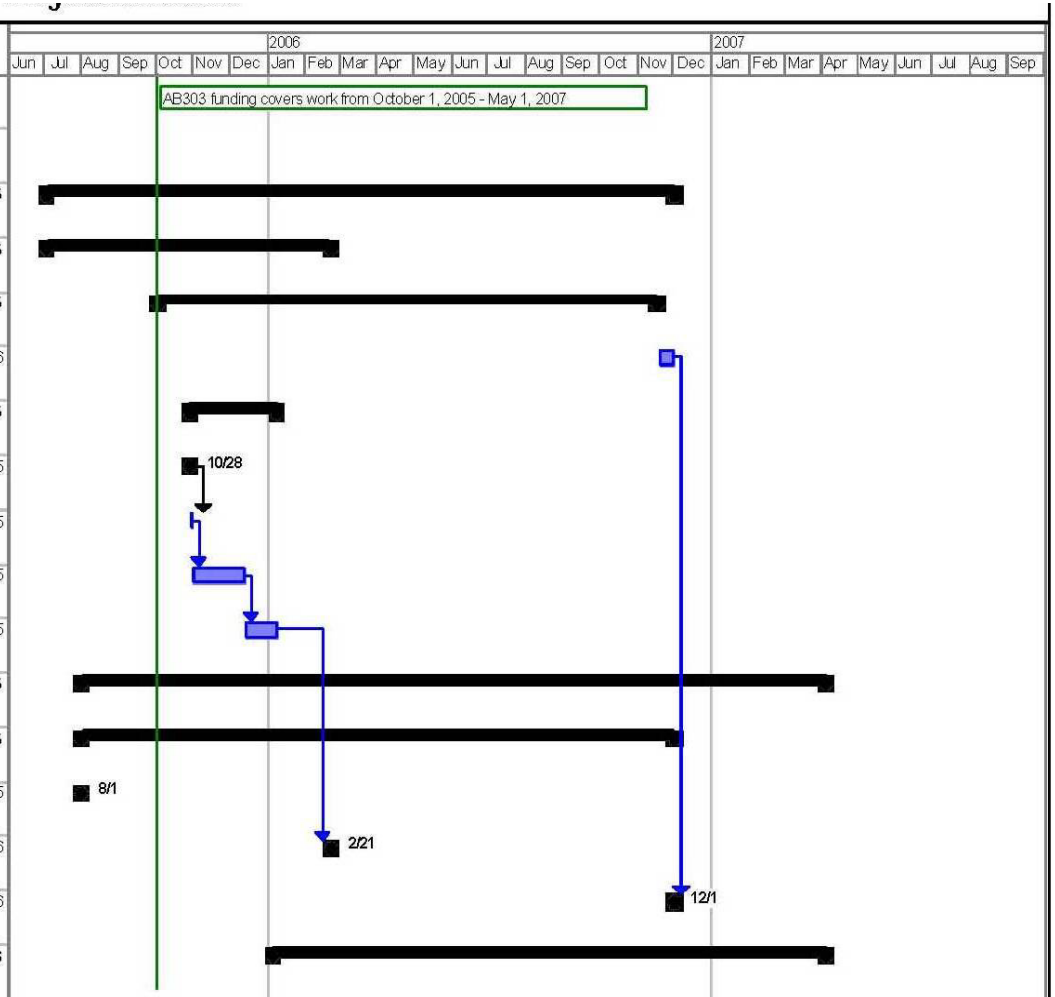
This task includes time for coordination of efforts with the internal project team members, as well as time for coordination meetings with the legal team, San Bruno staff and management, and other stakeholders, including the public.

The major steps in Task 3 include:

- Three public meetings in San Bruno; one upon selection of the monitoring well sites, one after drilling of the wells, and one upon completion of the project.
- Prepare quarterly progress reports for all tasks.

2005 PROJECT SCHEDULE

ID	Task Name	Start
1		
2		
3	**Task 1 - Design and Installation of Observation Well Clusters and Groundwater Monitori**	**Tue 7/5/05**
4	**Subtask 1.1 - Observation Well Clusters**	**Tue 7/5/05**
14	**Subtask 1.2 Groundwater Monitoring**	**Mon 10/3/05**
20	**Subtask 1.3 - Prepare TM1 - Well Design, Installation, and Monitoring Results**	Mon 11/20/06
21	**Task 2 - Enhanced Data Management**	**Fri 10/28/05**
22	**Conduct stakeholder workshop**	Fri 10/28/05
23	**Develop HDMS Workplan**	Mon 10/31/05
24	**Develop and populate HDMS**	Tue 11/1/05
25	**Prepare TM2 - HDMS users' manual**	Tue 12/13/05
26	**Task 3 - Project Management, Coordination, and Public Participation**	**Mon 8/1/05**
27	**Prepare for and conduct public meetings**	**Mon 8/1/05**
28	Public Meeting - Update on Well Locations	Mon 8/1/05
29	Public Meeting - Update on Well Installation and HDMS	Tue 2/21/06
30	Public Meeting - Update on Monitoring	Fri 12/1/06
31	**Prepare Quarterly Progress Reports**	**Fri 1/6/06**



2005 PROJECT BUDGET

(COSTS MAY VARY WITH YEAR AND LOCATION)

TASK	DESCRIPTION Hourly Labor Rate:	Principal $175	Field Geo. $110	Associate $120	AA $50	Unit Price $1	Total Cost	AB303 Grant Funding	San Bruno Funding
1	**DESIGN AND INSTALLATION OF OBSERVATION WELLS AND GROUNDWATER MONITORING**								
1.1	**Two Observation Well Clusters**	**48**	**368**	**206**	**12**	**$132,700**	**$206,900**	**$65,000**	**$9,200**
	Determine best locations for observation well clusters	8	8	32			$6,120	$0	$6,120
	Gain Access to locations			24	4		$3,080	$0	$3,080
	Design wells	12	16	40			$8,660	$8,660	$0
	Obtain permits			16			$1,920	$1,920	$0
	Schedule subcontractors			16	4		$2,120	$2,120	$0
	Perform utility survey			8			$960	$960	$0
	Drill and install observation wells (2 well clusters)	12	320	30	4	$130,500	$171,600	$41,100	$0
	Perform land survey			8		$2,000	$2,960	$960	$0
	Analyze data - logs etc.	16	24	32		$200	$9,480	$9,280	$0
1.2	**Monitoring and Reporting**	**24**	**16**	**68**	**0**	**$3,000**	**$17,120**	**$11,400**	**$5,720**
	Select well at SFIA FOM site for monitoring	4		12			$2,140	$2,140	$0
	Update Sampling Plan to include new wells	8		24			$4,280	$4,280	$0
	Conduct first round of semi-annual sampling		8	4		$1,500	$2,860	$0	$2,860
	Conduct second round of semi-annual sampling		8	4		$1,500	$2,860	$0	$2,860
	Analyze monitoring results	12		24			$4,980	$4,980	$0
1.3	**Develop technical memorandum**	**8**	**32**	**40**	**8**		**$10,120**	**$10,120**	**$0**
SUBTOTAL TASK 1		**80**	**416**	**314**	**20**	**$135,700**	**$234,140**	**$86,520**	**$14,920**
2	**ENHANCED DATA MANAGEMENT**								
	Conduct stakeholder workshop	8		24	2		$4,380	$4,380	$0
	Prepare HDMS work plan	4		24	4		$3,780	$3,780	$0
	Develop and populate HDMS	4		40			$5,500	$5,500	$0
	Prepare TM2 - HDMS users' manual	6		40	8		$6,250	$6,250	$0
SUBTOTAL TASK 2		**22**	**0**	**128**	**14**	**$0**	**$19,910**	**$19,910**	**$0**
3	**PROJECT MANAGEMENT AND COORDINATION**								
	Prepare for and conduct 3 public meetings	24		24	3		$7,230	$7,230	$0
	Prepare 6 Quarterly Progress Reports	6		18	6		$3,510	$3,510	$0
SUBTOTAL TASK 3		**30**	**0**	**42**	**9**	**$0**	**$10,740**	**$10,740**	**$0**
	Total Project Hours/Cost	**132**	**416**	**484**	**43**	**$135,700**	**$264,790**	**$117,170**	**$14,920**